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## ON THE PERIOD OF CAPELLA

In discussing the interferometer measures of *Capella* as a double star an independent and accurate value of the revolution period is very desirable. This can be furnished by a comparison of recent radial velocity observations with similar data obtained at the Lick Observatory<sup>1</sup> twenty-two years ago. To determine the period alone a comparatively few observations suffice.

The accompanying table gives the data for spectrograms recently obtained at Mt. Wilson. In the successive columns are found: plate number; date and Greenwich mean time of mid-exposure; measured velocity of the primary reduced to the Sun, obtained from line measurements with a Gærtner engine and with the Hartmann spectrocomparator against a sky standard; the mean of these two values; the velocity computed from the Lick Observatory elements; the residual velocity; the measured velocity of the secondary; its computed velocity; and finally, the residuals for the secondary. All plates except γ10677 were secured with a three-prism spectrograph having a camera lens of 40-inch focus, attached to the 60-inch reflector. The dispersion at H<sub>γ</sub> is 5 Å per mm. γ 10677 was secured with a one-prism spectrograph and above mentioned camera lens in which the dispersion of the center of the region used (H<sub>δ</sub>) is 12 Å per mm. The velocities derived from this plate are not used in the discussion that follows.

Plate No.	Date	Velocity of Primary					
		G. M. T.	Gaert.	Hart.	Mean	Comp.	O-C
km./sec.							
γ 10664	1921, Nov. 24, 18 <sup>h</sup> 58 <sup>m</sup>	+12.95	+12.59	+12.77	+11.07	+1.70	
10668	24, 22 56	+11.57	+11.78	+11.68	+10.89	+0.79	
10672	25, 22 56	+11.14	+10.88	+11.01	+ 9.85	+1.16	
10673	25, 23 12	+10.96	+11.01	+10.98	+ 9.84	+1.14	
10677	Dec. 7, 20 03	+2.7		+2.7	+4.3	-1.6	
10780	1922, Jan. 19, 16 24	+51.78	+50.65	+51.22	+52.07	-0.85	
10781	19, 17 29	+51.11	+51.80	+51.46	+52.10	-0.64	
Velocity of Secondary							
Plate No.		Meas.		Comp.	O-C		
			km./sec.				
γ 10672		+58.04	+55.76	+2.28			
10673		+49.94	+55.78	-5.84			
10677		+62.3	+62.8	-0.5			
10780		+ 1.21	+ 2.59	-1.38			

If we assume the residuals to be due entirely to a slight inaccuracy in the period it follows that the period derived at the Lick Observatory should be lengthened by 0<sup>d</sup>.017. Such a pro-

<sup>1</sup>Lick Observatory Bulletin, 1, 33, 1901.

cedure gives the maximum possible change in the period. The last two velocities have been found to be free from any systematic error by means of a check plate of the sky obtained at the same time. A spectrogram of *Pollux* obtained at the time the first four plates were secured is the only available check upon them. If we assume the constant velocity which has been found for this star by Lick Observatory and others, a systematic correction of  $-2.20$  km/sec is indicated for the first four velocities of *Capella*. As the residuals, when properly changed to correspond to this systematic correction, are then all negative (including that of  $\gamma$  10677 also), a simpler and more reasonable conclusion would be that the velocity of the center of mass of the system had changed. A decrease of  $0.9$  km/sec in this element would reduce the sum of the residuals to zero and the correction to the period would then be negligible.

In conclusion it may be said that the maximum correction to the period that our velocities will permit is  $+0^d.017$ . The evidence presented above for a correction to the center of mass velocity to explain the residuals is preferred, however, by the writer. In taking the middle course and ascribing the residuals partly to an incorrect period and partly to a change in the center of mass velocity, it seems a fair conclusion to say that the period as originally determined is certainly not in error by  $0^d.01$ .

The velocities for the secondary are not considered accurate. If taken as they stand the ratio of the masses comes out  $M_1/M_2 = 1.2$ .

If the systematic correction called attention to above is applied  $M_1/M_2 = 1.3$ . To follow the middle course  $M_1/M_2 = 1.26$ , as given in the Lick Observatory elements, would satisfy these later observations extremely well.

R. F. SANFORD.

1922, May 8.

#### THE PARALLAX OF $\alpha$ TAURI

Many parallax determinations have been published for this star. The discrepancies between the results are very considerable, however, and it was therefore placed on the parallax program of the 60-inch reflector. From 16 exposures I have